

REMARKS

Claims 1-16 are pending. Claims 6 and 7 were amended to correct an inconsistency in the definite article used in connection with a recited element, as was brought to Applicant's attention under a Section 112 rejection, but does not affect patentability. All of the claims were rejected on art. The amendments to Claims 6 and 7 overcome the Section 112 rejection and the art rejection is respectively traversed below.

Rejections Under 35 USC § 112

Claims 6 and 7 were rejected under 35 USC § 112, second paragraph, on the ground that there was insufficient antecedent basis for the limitation "said overload relay" in these claims. As suggested by the Examiner, the word "the" has been substituted for "said" to be consistent with the antecedent article "the" used in connection with the "overcurrent relay" in line 4 of Claim 5. As this is merely a correction of the definite article used in connection with an element to provide consistency with its antecedent, it does not affect the patentability of these claims.

These amendments to Claims 6 and 7 overcome the rejection under 35 USC § 112, second paragraph, which should now be withdrawn.

Rejections Under 35 USC § 103

Claims 1-8 were rejected under 35 USC § 103(a) as being unpatentable over Elmore (US 4,538,195) in view of Mentler (US 4,089,033). More particularly, it was stated that "Elmore discloses most of the elements of Claim 1 ... [h]owever it does not disclose a set of leads connecting the plurality of current transformers in parallel". Mentler was cited to disclose a set of leads connecting the plurality of current transformers in parallel.

Claim 1 is directed to a distributed bus differential relay that comprises in pertinent part: a plurality of current transformers each measuring current in an associated feeder line; a set of leads connecting the plurality of current transformers in parallel; and a plurality of differential relay elements connected across the set of leads and associated with one of the circuit breakers for tripping the associated circuit breaker in response to predetermined voltage conditions across the set of leads.

An object of the claimed invention was to provide a differential relay system with simplified wiring and that does not require an external power source to perform the relay function or trip the circuit breakers.

Elmore is directed to a three terminal differential protector relay for a transmission line which uses a communication channel 64 to interchange current information between protective relays at each of the terminals. The scheme requires one of the protector

relays to be specialized in order to sum the currents from the individual protective relays for distribution to each of the other relays. This requires a complex communication system between the relays and results in lower level signals being applied to the circuit breakers thereby requiring a separate power source for tripping the breakers.

Mentler is directed to a bus differential relay similar to the type described in the specification of the present application beginning at page 2, line 11 and extending to page 3, line 3. In this arrangement, all of the current transformers are connected in parallel to a common control circuit 79 which actuates a single protective relay 75. This relay 75 then actuates an auxiliary relay 34, which in turn energizes the trip coils 23, 24 and 25 of the three circuit breakers. It should be noted that both the protective relay 75 and the auxiliary relay 34 require external power as indicated by the "+" symbols on the leads 77 and 30. The wiring systems of each of these reference differential relays is more complicated than the combination of Claim 1; Elmore requires a complicated two-way communication system and vector summing components while Mentler requires external power sources and auxiliary relays to trip the individual breakers. There is nothing in either of these references that suggests a reconfiguration of both of these systems in order to arrive at the totally new arrangement as set forth in Claim 1, which can only be realized by an impermissible hindsight reconstruction of the cited art made possible by Applicant's disclosure.

Accordingly, Claim 1 is not obvious in view of any combination of the teachings of Elmore or Mentler, whether taken singly or in combination. Claims 2 through 8 all depend from Claim 1 and are therefore patentable over the references for the same reasons.

Furthermore, Claim 4 calls for the circuit breakers to have low energy trip devices and for the differential relay elements to be powered by the associated current transformer and generate a low energy trip signal that trips the low energy trip device of the associated circuit breaker. Mentler has been relied upon as disclosing circuit breakers having low energy trip devices that are powered by the associated current transformer and generating a low energy trip signal which trips the low energy trip device. To the contrary, as discussed above, in Mentler the protective relay 75, while energized by the current transformers, switches current in the auxiliary trip circuit 77 that is powered by another source as shown by the "+" symbol. Furthermore, this auxiliary trip circuit in turn actuates the auxiliary relay 34 which switches a source independent of the current transformers, again as indicated by the "+" symbol on the trip circuit 30 to energize the trip coils of the circuit breakers. Thus, Mentler does not teach using the energy generated by the current transformers to trip the circuit breakers, and in any event, there is nothing in Mentler to suggest that the trip circuits are low energy. Rather, the

use of an external power source strongly suggests that these are not low energy trip devices, as is conventional.

Claims 9, 11 and 13 were rejected under 35 USC § 103(a) as being unpatentable over Elmore in view of Mentler and further in view of Granville (US 5,181,026). Claim 9 adds to Claim 1 that at least one of the differential relay elements includes a voltage limiting device connected to limit voltage across the leads connecting the current transformers in parallel to a preselected voltage. Granville is cited to disclose a voltage limiting device connected across the outputs of the current transformer for limiting voltage. First, Claim 9 depends from Claim 1. As discussed above, Elmore and Mentler, whether taken singly or in combination, do not teach or suggest the combination of Claim 1. Granville adds nothing to overcome the deficiencies of these two references with regard to Claim 1, and hence, cannot therefore render Claim 9 unpatentable. Secondly, the varistor in Granville is used to limit the voltage to the power supply and does not limit the voltage across the resistor RC which is used by the current sensing circuit to measure the current in the lead 12. Granville is directed to a power line monitor and has no relevance to differential protective relaying. Accordingly, Claim 9 patentable distinguishes over any combination of the references Elmore, Mentler and Granville. Claims 11 and 13 both depend from Claim 9 and are therefore patentable over the references for the same reasons.

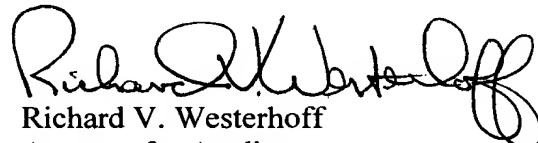
Claims 12 through 14 and 15 were rejected over Elmore in view of Mentler and Granville and further in view of Webb (US 5,982,597). Claim 12 depends from Claim 11 and calls for each of the differential relay elements to include a shorting device. Claim 12 depends from Claim 9 and is therefore patentable over Elmore, Mentler and Granville for the same reasons. Webb is directed to a specific type of varistor that incorporates a fusible shorting device. Clearly, this reference does not make up for the deficiencies in the teachings of the Elmore, Mentler and Granville references with regard to combination of Claim 12. Accordingly, Claim 12, and Claims 14 and 15 which depend from it, are not rendered unpatentable by the combined teachings of Elmore, Mentler, Granville and Webb.

Claim 16 was rejected under 35 USC § 103(a) as being unpatentable over Elmore in view of Mentler, Granville, Webb and further in view of Alley et al. (US 4,701,680). Claim 16 depends from Claim 15 and is therefore patentable over any combination of Elmore, Mentler, Granville and Webb for the same reasons. Alley et al. discloses a fluorescent lamp dimmer that includes a resistor in series with a varistor and a circuit that provides overvoltage control to the dimmer circuit. This teaching adds nothing to the teachings of the other references

that would render Claim 16 obvious. Therefore, Claim 16 patentability distinguishes over the references.

In view of all the above, reconsideration and allowance of the application as now presented is respectfully solicited.

Respectfully submitted,



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